

COASTAL SERVICES

VOLUME 15, ISSUE 4 • SEPTEMBER/OCTOBER 2012

LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

THE MESSAGE MATTERS: CHANGING COMMUNICATION ABOUT CLIMATE IN VIRGINIA

RED TIDE RANGERS WRANGLE DATA DURING
TEXAS HARMFUL ALGAL BLOOMS

ASSESSING WATERFRONT SMART
GROWTH SUCCESS IN MICHIGAN



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Volume 15 | Issue 4 | September/October | 2012
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

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FROM THE DIRECTOR

How are you talking to your constituents and stakeholders about climate change? More importantly, are you listening?

With the highest rate of sea level rise on the Atlantic coast, Virginia coastal resource managers had reason to push their message to protect wetlands. But as we reveal in the cover story for this edition, they didn’t start gaining traction on their adaptation goals until they began addressing what was of primary concern to local residents, managers, and planners.

As you will read, Virginia managers make it clear that the message about climate change matters.

Also in this edition, you will find articles about how a band of about 30 volunteers is making a significant difference to Texas red tide monitoring efforts, and how the work of Michigan managers is helping waterfront communities become more sustainable and economically vibrant.

Our writers also look at the new Georgia Coastal Hazard Portal, which provides all the information that local planners and managers need to prepare for the next big storm.

At the root of all these coastal management issues are people. After all, the red tide data the volunteers are collecting in Texas are used to issue warnings to citizens and to document the effects on resources and fisheries to determine the impacts on people.

Coastal officials rightly depend on the biological and physical sciences to help them make the best decisions. A newer kid on the block, however, is gaining traction: the social sciences.

More and more NOAA constituents are tapping into the Coastal Services Center for their introduction to social science products and services.

For instance, our recent Social Coast Forum (www.csc.noaa.gov/socialcoastforum), the first conference focused on bringing together social science and coastal applications, attracted hundreds of participants.

Even more are going to the Social Coast website (www.csc.noaa.gov/digitalcoast/socialcoast) to get coastal economic and demographic data and to learn about basic but important economic principles through our humorous economic video series.

Doing a better job of incorporating the human element into the decision-making process is probably one of the most important things we can do for the future of our coasts. I’m proud that the Center—and NOAA—are helping to lead the way. ❖

Jeff Payne, Acting Director

the message matters:

changing communication about climate in virginia

With the highest rate of sea level rise on the Atlantic coast, the message to protect wetlands from climate change impacts was a priority to Virginia resource managers. But it wasn't until they changed their message to include infrastructure and public safety that local managers and planners began not only to listen—but to talk.

"Changing our message changed the game," says Skip Stiles, executive director of Wetlands Watch, a statewide nonprofit environmental group. "The conversations we're now having are helping to stimulate early adaptation work."

Wetlands Watch has worked for about five years to initiate local government sea level rise adaptation planning and to see those plans implemented through land use and other regulatory decisions.

Stiles says it was when they shifted their focus from wetlands to protecting homes and jobs from higher storm surges resulting from sea level rise that their efforts began to get traction.

"There was an overlap and a way to reframe the message from 'save the wetlands' to basically 'save the community.'"

Skip Stiles,
Wetlands Watch

"Skip's done an amazing job of engaging with and listening to a diverse group of stakeholders," says Troy Hartley, director of Virginia Sea Grant, which is a partner organization of Wetlands Watch. "The key to his communication strategy has really been listening and focusing on what his audience cares about."

RISING TIDES

Coastal communities in Virginia are some of the most vulnerable in the U.S. when it comes to sea level rise. With a relative increase of 1.45 feet over the last century, the City of Norfolk is already experiencing flooding whenever there is a full moon during high tide.

Future projections for rates of sea level change in the Chesapeake Bay region show anywhere from an additional 2.3 to 5.2 feet of rise in the coming century.

Both natural ecosystems and developed areas are at risk, Hartley says. "Virginia coastal communities face multiple challenges in their efforts to adapt to sea level rise, including increased beach erosion, inundation and migration of wetlands, and flooding from heavy rain events and storm surges."

Significant community assets, such as ports, railways, utilities, roads, military installations, and other critical infrastructure, are vulnerable.

STAGGERING REALIZATION

Stiles and Wetlands Watch determined that potential tidal wetland losses in the next century could be 50 to 80 percent, depending on the type of wetland and shoreline development and erosion control decisions that are made primarily at the local level.

"We realized that all our efforts to save postage-size pieces of wetlands paled in comparison to the loss of wetlands we would experience from 3 feet of sea level rise," Stiles says. "It was staggering."

The group determined, he says, that in order to achieve its goal of "keeping the shoreline open, resilient, and non-hardened," they were going to have to address sea level rise.

DOOM AND GLOOM

In 2007, Wetlands Watch began work at the local level in Virginia to initiate sea level adaptation strategy development. Early social marketing and outreach efforts focused on protecting the tidal ecosystem from climate change impacts.

"I bummed out more Kiwanis Club meetings," admits Stiles. "It was like having Dr. Doom for breakfast."

Wetlands Watch staff members spent a year speaking to civic and other local groups and "just getting blistered at rural meetings where we encountered severe climate skeptics," he says. "It became apparent we weren't getting any traction that we needed to make a difference."

STOPPING TO LISTEN

"Part of the problem," says Hartley, "is that people don't know what wetlands are good for, and they're not inclined to take the time to figure that out. I'm sure Skip didn't want to hear that, but he did, and he began asking, 'What do these guys care about?'"

The answer, he says, is that "they care about their communities, their homes, their jobs, recreation, their kids' schools, and the future of their community for their kids. Skip was then able to start connecting how wetlands advance those interests and frame it that way."

Stiles says he realized that jobs, communities, and public safety would all be impacted by sea level rise, and often part of the solution would be wetlands protection.

"There was an overlap," he says, "and a way to reframe the message from 'save the wetlands' to basically 'save the community.'"

CONVERSATION STARTER

In 2008, Wetlands Watch changed its message to the need to protect communities and jobs from higher storm surges resulting from sea level rise.

General social marketing information provided the group with some guidance and emphasized the need to put the issues into a local context, make the impacts personal and real, and show the immediate impact of the threat and the cost of inaction.

"When we went back out with the reframed message, back into these same communities, instead of arguing with us, people in the audience began sharing the changes they were observing," Stiles says. "They started sharing how they used to hunt ducks in wetlands that aren't there anymore, or how they're having trouble with inundation and flooding, and are having their insurance withdrawn."

He adds, "It was really quite a stunning change. We began engaging people and bringing an abstract distant issue to concrete focus in the present."

PLANNING PROGRESS

Since 2008, Wetlands Watch staff members have spoken at public meetings, testified and appeared before government bodies, consulted with local and regional planning professionals, and offered comments on government land use and regulatory

decisions. They've also engaged with nontraditional partners, especially those in the private sector, and floodplain and emergency managers.

Sea level rise and other climate change impacts are starting to be addressed in communities' comprehensive and long-range land use plans, and Stiles served on the Virginia Commission on Climate Change in 2008, which developed an outline of a state-level adaptation action plan.

With funding from the National Fish and Wildlife Foundation, Wetlands Watch is cataloguing numerous planning efforts at the local and regional levels that serve as effective planning tools for climate change impacts, and are developing these tools into a toolkit for local government policy makers.

They're also participating in a Sea Grant Climate Adaptation program that will result in best practices for adapting to sea level rise and other climate challenges for coastal communities and other partner programs.

BROADER IMPACT

Wetlands Watch's constant listening and targeting of its message has

reinforced Virginia Sea Grant's communication strategies, Hartley says. "We are watching and learning from their efforts."

He adds, "We're finding across the board that nongovernment organizations, Sea Grant, and other coastal managers are all getting much more sophisticated in understanding our audience and using words that make sense to our listener, not words that just make sense to us."

"You have to start where the public is," agrees Stiles. "What do they care about? Putting these issues into terms that people can relate to is critical, whether it's localized data or using storm events."

The key, he says, is looking for opportunities. "You have to focus on the silver lining in the dark cloud. If your message is all about restricting the future, that sets stakeholders up to fight. Our message is about finding new opportunities while adapting to these challenges and spurring innovation. That's an exciting message that everyone can get behind."

Stiles notes, "You always have to leave hope on the table, and provide a path forward." ❖

*For more information on how Wetlands Watch is communicating about climate change, contact Skip Stiles at (757) 623-4835 or skip.stiles@wetlandswatch.org.
For information on broader climate communication efforts in Virginia, you may contact Troy Hartley at (804) 684-7248 or thartley@vims.edu.*

Red Tide Rangers Wrangle Data During Texas Harmful Algal Blooms

“Having trained volunteers who can give us accurate data helps us do our jobs.”

Meridith Byrd,
Texas Parks and Wildlife Department

When a harmful algal bloom was detected in September 2011 in Texas waterways, state coastal resource managers called in the Red Tide Rangers. This band of about 30 volunteers—which has its own theme song and a secret handshake—does the sampling, cell counting, and site monitoring that state researchers neither have the time nor resources to do.

When the bloom turned into one of the largest and longest-lasting red tides in documented Texas history, state biologists relied on the Red Tide Rangers as “an invaluable part” of their red tide monitoring program.

“They’re out there giving us daily data,” says Meridith Byrd, the harmful algal bloom response coordinator at the Texas Parks and Wildlife Department. “There’s no other network like them along the Texas coast. Without them, we wouldn’t be getting the kind of data we need.”

The data the rangers provide are used by resource managers to issue warnings to citizens, ground-truth NOAA satellite imagery, and document the effects on resources and fisheries.

“I can’t say enough about them,” Byrd says. “Texas has a very long coastline. We just have painfully few biologists who



Tony Reisinger analyzes water samples for red tide.

PHOTO BY SETH PATTERSON AND COURTESY OF TEXAS SEA GRANT COLLEGE PROGRAM

can go out and collect data and come back and analyze it so that we can put it in a format that will be helpful to people.”

RED TIDES

While there are thousands of species of microscopic algae in our nation’s coastal waters, only about a dozen cause harmful algal blooms that can result in massive fish kills, contamination of shellfish beds, and human illness.

These species are often called “red tides” because a bloom can turn the surrounding water red. But the name can be a little misleading since water can also be other colors or not have any color, and nontoxic species can also color the water.

The small photosynthetic plant *Karenia brevis* is an ever-present inhabitant of the Gulf of Mexico, but

usually in extremely small numbers of cells per milliliter of water.

“Finding one cell here and there is not enough to cause a panic, but finding even a handful of cells can spur us into stepping up our monitoring to determine if the counts will continue to grow over time into a full-blown bloom,” Byrd says.

SIDE EFFECTS

Karenia itself is not harmful. The danger comes from a potent poison called brevetoxin that the alga carries, which can be released when the fragile cells break in waves.

When broken, the cells release their brevetoxin into the water, where it mixes with the salt spray to form an aerosol that irritates eyes and respiratory systems. Healthy people

suffer little more than discomfort, but the aerosol can pose much greater danger to asthmatics and others who suffer from respiratory conditions.

Brevetoxin is also dangerous if it is ingested through eating tainted seafood, including oysters, leading to neurotoxic shellfish poisoning. Animals, particularly dogs and coyotes, have died from eating contaminated fish.

A harmful algal bloom can require the closure of oyster harvesting, creating significant economic impacts for local fisheries.

FIRST SIGN

The state’s most recent bloom, which lasted five months, was first detected near the City of South Padre Island by a Texas Parks and Wildlife Department staff member who noticed fish swimming erratically and gulping for air near the water’s surface.

Tony Reisinger, a county extension agent for coastal and marine resources at Texas Sea Grant, soon confirmed the presence of *Karenia* cells.

He immediately called in the squad of volunteers.

CALLING IN REINFORCEMENTS

Reisinger formed the Red Tide Rangers along with Don Hockaday, director at the University of Texas-Pan American’s Coastal Studies Laboratory, during a 1996 harmful algal bloom.

Coastal managers had already been through a bloom in 1986 that spanned the whole Texas coast, killed 22 million

fish, and is still considered the largest and worst in state records, as well as several smaller blooms in the early 1990s.

Knowing they couldn’t collect and analyze the number of samples needed to adequately monitor a bloom, Reisinger and Hockaday decided to train volunteers to collect water samples from locations around South Padre Island suspected of having red tide.

Reisinger dubbed the initial class of about 20 volunteers the Red Tide Rangers.

TOO MUCH OF A GOOD THING

The volunteers did such a good job that they soon overwhelmed Reisinger and Hockaday with more samples than they could analyze in a timely manner. The solution, says Reisinger, was to train the volunteers to identify and count *Karenia* cells.

The volunteers also note the number of dead fish, if any, and gauge the severity of the irritating aerosol created when red tide cells break apart in the surf.

Ranger training is held every summer, and a secondary volunteer program was created called the Texas Coastal Naturalists to engage the rangers between red tides.

BIG BUT NOT SO BAD

In terms of geographical size, the latest red tide was on par with the 1986 bloom, but it was much less severe in terms of fish mortality, only killing about 4.5 million fish.

While it was an inconvenience at times to coastal residents, it devastated the state’s oyster industry, which was closed along most of the coast through February 2012, costing oyster fishermen about \$7 million.

Byrd says most of the information she uses to track red tide in the South Padre Island area comes from the Red Tide Rangers. The raw data they provide not only help state and federal agencies monitor and predict blooms, but also aid officials in determining fisheries closures and in updating the public so people can better judge health risks.

“When a red tide hits, you pretty much just have to drop everything,” Byrd says. “Having trained volunteers who can give us accurate data helps us do our jobs.”

She adds, “It’s really amazing to have something in place like this that works so well. I’m very confident in them.” ❖



A volunteer Red Tide Ranger takes water samples during a bloom.

PHOTO BY SETH PATTERSON AND COURTESY OF TEXAS SEA GRANT COLLEGE PROGRAM

For more information on the Red Tide Rangers, contact Tony Reisinger at (956) 493-8129 or e-reisinger@tamu.edu. For more information on the state’s harmful algal bloom response, contact Meridith Byrd at (361) 575-6306 or meridith.byrd@tpwd.state.tx.us.

Michigan’s Coastal Communities Assess Waterfront Smart Growth Success



Accessible walkways and scenic views are key elements for waterfront smart growth.
PHOTO COURTESY OF MICHIGAN SEA GRANT

The potential of Michigan’s waterfront communities to attract people for work, living, and play is hampered when waterfronts lack public access, walkability, or a mix of scenic and civic uses. Now a self-assessment tool and workshop can help communities support their waterfronts to be sustainable and economically vibrant centers for public life.

“It’s exciting to see different parts of a community come together with a vision for their waterfront—seeing where they are right now and where they might want to be,” says Mark Breederland, an extension educator and workshop facilitator for Michigan Sea Grant.

Michigan’s Waterfront Smart Growth Readiness Assessment Tool is a voluntary self-audit that is undertaken by officials and stakeholders in waterfront communities during facilitated workshops.

In 2010 and 2011, eight communities piloted the tool, and more communities will participate in the coming months. The online tool asks the community to rate its performance on waterfront smart growth principles such as compact community design, the preservation of open space and natural beauty, community collaboration, and other factors (see “Smart Growth Coastal and Waterfront Elements”).

Each community later receives an objective score and written summary outlining its smart growth successes, benchmarking its progress, and suggesting potential areas of improvement.

“It’s exciting to see different parts of a community come together with a vision for their waterfront—seeing where they are right now and where they might want to be.”

*Mark Breederland,
Michigan Sea Grant*

The Michigan Citizen Planner, Planning and Zoning Center, and Land Policy Institute of Michigan State University (MSU) developed the waterfront smart growth tool, which was inspired by and adapted from MSU’s original Smart Growth Readiness Assessment Tool.

Michigan Sea Grant and MSU’s Greening Michigan Institute facilitate the workshops and complete final reports. Tool development was funded by NOAA’s Office of Ocean and Coastal Resource Management through Michigan’s Coastal Zone Management Program.

ASSETS AND CHALLENGES

With 3,288 miles of coast, second in length only to Alaska, Michigan has many waterfront assets.

The state’s coastal communities front four Great Lakes and provide homes for 44 percent of Michigan’s population. Moreover, an estimated 804,381 state jobs relate to the Great Lakes and translate into \$54 billion in annual employee compensation, according to “Michigan’s Great Lakes Jobs,” a 2009 report by Michigan Sea Grant.

“Waterfront communities have a competitive advantage because people want to work and play there,” says Breederland. “Many of our towns want to strengthen their waterfront economy by preserving character and public access, but challenges may be in the way. This tool was developed to help them understand both their success and their problems, so they can succeed.”

Michigan’s challenges are shared by many other U.S. waterfront communities. For instance, the departure of big industry may have left brownfields and structural eyesores along

the waterfront. The waterfront may be dominated by one or two types of uses that are spread out, instead of a mix of uses placed close together that draw many people. Or it may have transitioned from water-dependent uses, like fisheries, to non-water-dependent uses such as condo construction that block scenic views or access to natural resources.

ONE CITY’S EXPERIENCE

The City of Alpena and its surrounding township are located in northeastern Michigan along Lake Huron’s Thunder Bay and Thunder Bay River.

“When we took the self-assessment, we were quite pleased to see our successes,” says Greg Sundin, the city’s director of planning and development. Alpena’s waterfront area includes a picturesque downtown with commercial, recreational, and tourism sectors; an 18.5-mile loop for biking, walking, and inline skating; and easy access to Thunder Bay National Marine Sanctuary.

Moreover, in 2010 a new zoning ordinance adopted by the City of Alpena included a mixed-use waterfront development district that encourages property ownership and water-related land uses while opening up public access to the waterfront.

“One thing the assessment made clear is that we needed a better working knowledge of how our local waterfront regulation process related to state and federal regulations,” says Sundin. “As a result, we are strengthening this weak information link so we can better assist our riverfront property owners in understanding the permits they need, which agencies have to be involved, and how to start the process.”

ONWARD AND UPWARD

With results in on the pilot, the project partners are now considering a few adjustments that could make the tool and webpage more accessible and user friendly. A second wave of self-assessment workshops is also planned.

One of the best experiences for Breederland is seeing how communities use self-assessment to build smart growth momentum. “At the end of one workshop, people volunteered to stay afterward, and they decided

to meet twice a year from then on to track their progress with waterfront smart growth,” he says.

The self-assessment is designed so it can be repeated. “We have hopes,” Breederland says, “of going back to these communities a few years from now and watching them congratulate themselves when their smart growth scores go up.” ❖

Smart Growth Coastal and Waterfront Elements

- Mix land uses, including water-dependent uses.
- Take advantage of compact community design that enhances, preserves, and provides access to waterfront resources.
- Provide a range of housing opportunities and choices to meet the needs of both seasonal and permanent residents.
- Create walkable communities with physical and visual access to and along the waterfront for public use.
- Foster distinctive, attractive communities with a strong sense of place that capitalizes on the waterfront’s heritage.
- Preserve open space, farmland, natural beauty, and the critical environmental areas that characterize and support coastal and waterfront communities.
- Strengthen and direct development toward existing communities and encourage waterfront revitalization.
- Provide a variety of land- and water-based transportation options.
- Make development decisions predictable, fair, and cost-effective through consistent policies and coordinated permitting processes.
- Encourage community and stakeholder collaboration in development decisions, ensuring that public interests in and rights of access to the waterfront and coastal waters are upheld.

From *Smart Growth for Coastal and Waterfront Communities* at www.coastalsmartgrowth.noaa.gov/smartgrowth_fullreport.pdf.

For more information on the Waterfront Smart Growth Readiness Assessment Tool, contact Wayne R. Beyea, extension specialist and instructor for Michigan State University’s School of Planning, Design, and Construction at beyea@msu.edu or (517) 432-7600. You can also learn more by visiting www.landpolicy.msu.edu/sgrat/pages/about.html.

New Portal Helps Decision Makers Visualize Coastal Hazards in Georgia

"This site is where you can go to find the most critical information for the hazards we face along the Georgia coast."

Clark Alexander,
Skidaway Institute of Oceanography

The last hurricane to significantly impact Georgia was Dora in 1964. As a result, many coastal residents have never experienced a hurricane and don't realize the risk they face from future storms.

To help local decision makers and residents visualize the potential impact of hurricanes—and other coastal hazards—scientists and state coastal resource managers have developed a Web-based Georgia Coastal Hazard Portal. The interactive map displays information about sea level rise, shoreline change, storm surge, Federal Emergency Management Agency flood zones, historical hurricane tracks, land use and cover, armored shorelines, and more.

It also includes detailed information on Dora—including vintage photos of the damage that resulted from the storm.

"This site is where you can go to find the most critical information for the hazards we face along the Georgia coast," says Clark Alexander, a professor at Skidaway Institute of Oceanography



Damage from Hurricane Dora in 1964 (top) and what's at risk along the Georgia coast today.

DORA PHOTO COURTESY OF THE CENTERS FOR OCEAN SCIENCES EDUCATION EXCELLENCE—SOUTHEAST AND THE UNIVERSITY OF GEORGIA MARINE EXTENSION
PRESENT-DAY PHOTO COURTESY OF SKIDAWAY INSTITUTE OF OCEANOGRAPHY

and the project lead. "It provides all the information that planners, managers, and folks who are trying to evaluate the risk to communities need to help them do their jobs."

For instance, Alexander says, planners at the Chatham County–Savannah Metropolitan Planning Commission are using the tool to determine the long-term impact of localized flooding and sea level rise. And Chatham County floodplain administrators are planning to use the portal to give property owners specific information about how sea level rise and erosion are predicted to affect properties along a waterway or marsh.

In addition to being a good decision-support aid, the tool is also easy for the layperson to use. "You don't have to be a computer expert to use it," he says. "People can look through risks related to their area, which makes the hazard information a little more personal."

Released in March, the portal was created with ArcGIS Viewer for Flex by the Skidaway Institute and the Savannah Area GIS program with funding from the Georgia Coastal Zone Management Program.

Although coastal hazards is a fairly new issue area for the Georgia Department



of Natural Resource's coastal program, there has been a high demand for hazards data from educators, researchers, and local, state, and federal governments, says Jennifer Kline, the coastal program's hazards specialist. Hazards-focused grant projects, such as the portal, have increased the coastal program's knowledge and resources.

To help ensure that the portal is used by planners and local officials, Angela Bliss, a marine education specialist for the Centers for Ocean Sciences Education Excellence–Southeast and the University of Georgia Marine Extension, is leading a team to conduct training sessions throughout the six coastal counties.

The portal could "definitely be duplicated in any state, if they have similar data sets," notes Kline.

Alexander adds, "I see local or state portals as a great way to disseminate data that may not be widely available, but are pertinent to management goals." ❖

To launch the Georgia Coastal Hazard Portal, go to <http://gchp.skio.usg.edu>. For more information, you may contact Clark Alexander at (912) 598-2329 or clark.alexander@skio.usg.edu, Jennifer Kline at (912) 262-3049 or Jennifer.Kline@dnr.state.ga.us, or Angela Bliss at (912) 598-2387 or acbliss@uga.edu.

NEED SOME HELP?
Put an order in for a Coastal Management Fellow.
Proposals from state coastal programs due in October.



Sea Level Rise Viewer

Community Maps and Visuals

www.csc.noaa.gov/slr

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NEWS YOU CAN USE

FROM THE NOAA COASTAL SERVICES CENTER

Using Social Media in the Government Realm

The social media landscape can seem impossible to conquer. But all hope is not lost. A plethora of resources can help you become adept at using online networking sites, even for government purposes. A good place to start is by viewing successful uses of social media by organizations similar to yours, such as the NOAA Coastal Service Center's Facebook and Twitter accounts. At the same time, check with your agency for its list of approved sites and any rules and regulations that go along with using those sites. A few pointers can go a long way toward smoothing your path:

Educate yourself and your team members before starting –

Get to know each social media site you are considering before diving in. I'm sure you have heard of Twitter and Facebook, but perhaps you do not know the intimate details. Take time to read the "About" pages, ask colleagues and friends for pointers, and look at how other people and agencies are using the site. Then take the time to educate your team on what you have discovered. Having everyone starting on the same page will be worth the trouble.

Have a plan – Develop an outline of why you want to use a specific site, and articulate your goals. Chances are you'll need to fill out an application to receive approval to use the site, and your outline will help you answer questions that the application will raise. You may even need to list points of contact and suggested user names. Before signing up, have a team meeting to discuss all these areas so the site has a focused purpose.

Determine your process for writing and approving posts for the site – Who will be writing the posts and managing the site? Will several people be involved? Do the posts need to go through editing or the communications office before they can be sent out? Knowing all of these answers and the exact process for how you will manage your social media sites will save you time and frustration.

Remember to plan well. There's no need to rush into social media. Take the time to learn about each site to determine which ones are right for you and your agency. ❖



Visit the Center's social media accounts, as well as those of the Multipurpose Marine Cadastre, for examples of how to use social media effectively:
www.facebook.com/NOAACoastalServices, www.twitter.com/CoastalService, www.facebook.com/MarineCadastre, and www.twitter.com/MarineCadastre.

HURRICANE LANDEFALLS

It can't happen to me, right?

Activity in the Atlantic – 2002 to present

159 named storms

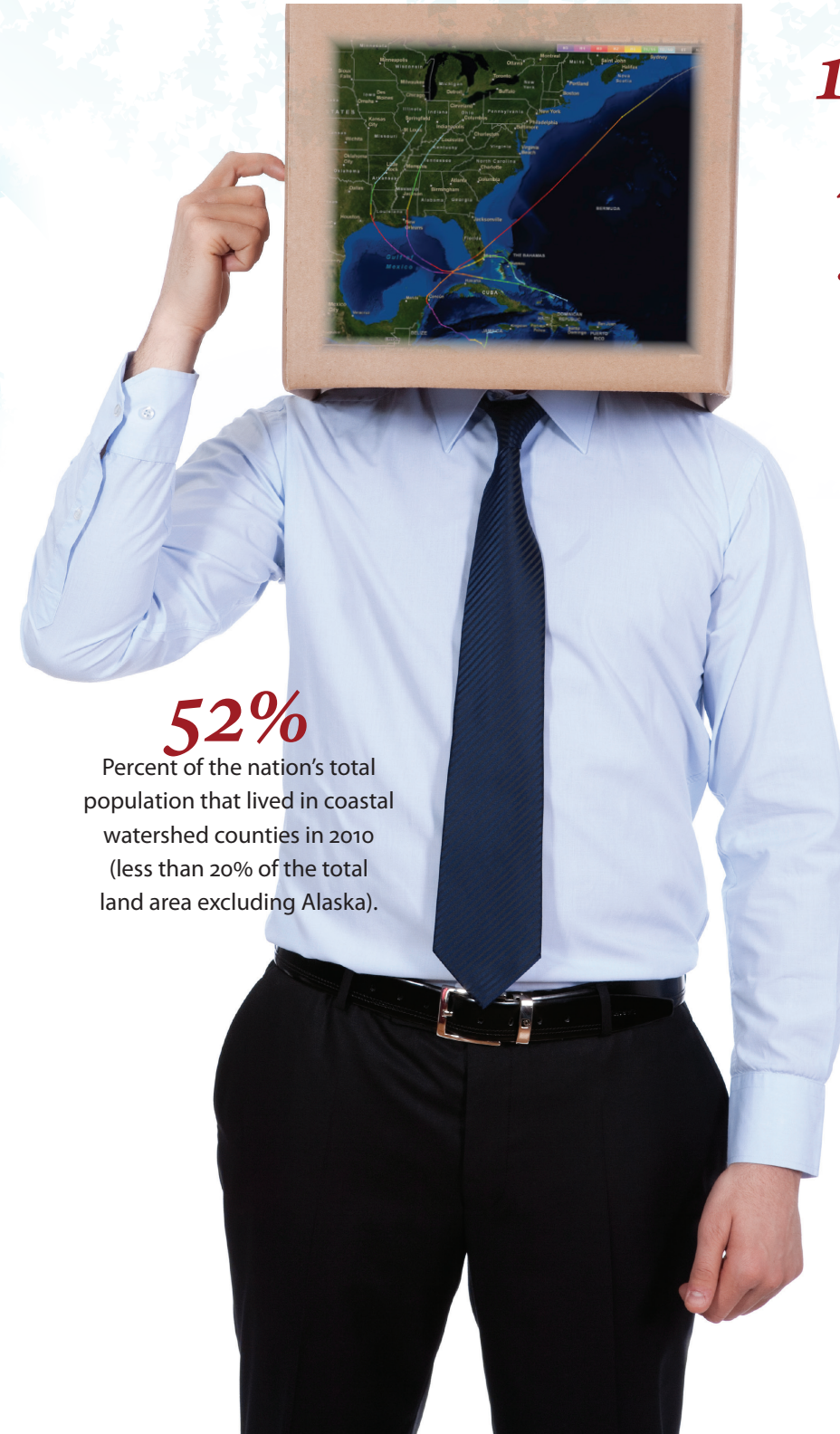
76 hurricanes

38 major hurricanes

43 U.S. landfalls from tropical cyclones

18 hurricane landfalls

7 major hurricane landfalls (none since 2005)



52%

Percent of the nation's total population that lived in coastal watershed counties in 2010 (less than 20% of the total land area excluding Alaska).

Seeing the paths of previous hurricanes is one of the best ways to drive home a hurricane preparedness message.

With the Historical Hurricane Tracks website, users enter the location of interest and frame the search by indicating what storm categories they are interested in and what years to include. The application then pulls from over 150 years of global data to create an interesting and informative map that illustrates storm tracks and intensities.

The site also includes historical and current U.S. coastal population trends and storm-specific reports compiled by NOAA's National Hurricane Center.

Historical Hurricane Tracks
www.csc.noaa.gov/hurricanes



NOAA Coastal Services Center

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Coastal GeoTools 2013

Here you'll see new technologies and applications, and learn from peers how the best and brightest are addressing today's coastal issues using geospatial data and tools.



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March 25 to 28, 2013

Myrtle Beach, South Carolina

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